

## CLAIMS

1. A permanent-magnet type synchronous motor comprising a stator core having  $Z$  ( $Z$  is a natural number) slots, on which a coil is arranged, a rotor having permanent magnets of  $2 \times p$  ( $p$  is a natural number) poles and inserted into a torus of the stator core, and a pressurizing part that pressurizes an outer periphery of the stator core inward in  $N$  locations, the  $N$  being any one of plus values among values calculated from  $N = p$ ,  $N = \pm 2 \times p - Z \times i1$  ( $i1$  is an integer of at least 0), or  $N = Z \times i1 \pm 2 \times p$ .

2. The permanent-magnet type synchronous motor according to claim 1, wherein the  $N$  is a plus minimum value among values calculated from  $N = p$ ,  $N = \pm 2 \times p - Z \times i1$  ( $i1$  is an integer of at least 0), or  $N = Z \times i1 \pm 2 \times p$ .

3. The permanent-magnet type synchronous motor according to claim 1, wherein the pressurizing part comprises a frame that fixes the stator core and rotatably supports one end of the rotor.

4. A method of manufacturing a permanent-magnet type synchronous motor by fixing a stator core in a frame, the method comprising making a specific region of the frame and a specific region of the stator core, respectively, reference positions and fixing the both specific regions together after positioning them in a specific positional relationship.

5. The method of manufacturing a permanent-magnet type

synchronous motor, according to claim 4, wherein the specific region of the frame comprises regions, in which an outer periphery of the stator core is pressurized inward in N locations (N is an integer) with larger forces than those for other regions.

6. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 5, wherein a pressurizing member such as a spacer, is provided in the specific region of the frame for inward pressurization with larger forces than those for other regions.

7. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 4, wherein in the case where the specific region of the frame and the specific region of the stator core, respectively, are made the reference positions, and fixed together after the both specific regions are positioned in the specific positional relationship, the specific region of the stator core comes to a teeth center, or a slot center.

8. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 4, wherein in the case where the specific region of the frame and the specific region of the stator core, respectively, are made the reference positions, and fixed together after the both specific regions are positioned in the specific positional relationship, the specific region of the stator core comes to a joint (seam).

9. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 4, wherein in the case where the specific region of the frame and the specific region of the stator core, respectively, are made the reference positions, and fixed together after the both specific regions are positioned in the specific positional relationship, the specific positional relationship positions the number  $N$  of locations of pressurization of the frame and the reference positions of the stator core and the frame so as to cancel cogging torque of the stator core, which is beforehand measured before mounting of the frame.

10. A method of manufacturing a permanent-magnet type synchronous motor, the method comprising the step of inserting and assembling a rotor having permanent magnets of  $2 \times p$  poles ( $P$  is a natural number) into a torus of the stator core formed to be torus-shape and having  $Z$  ( $Z$  is a natural number) slots, on which a coil is arranged, the step of rotating the rotor in a state, in which electric current is not caused to flow through the coil, to measure cogging torque every angle, the step of determining those locations, in which an outer periphery of the stator core is pressurized, on the basis of measurements of cogging torque, and the step of assembling pressurizing parts, which pressurize the outer periphery of the stator core, to an outside of the stator core in  $N$  locations,  $N$  being any one of plus values among values calculated from

$N = p$ ,  $N = \pm 2 \times p - Z \times i_1$  ( $i_1$  is an integer of at least 0), or  
 $N = Z \times i_1 \pm 2 \times p$ .

11. A method of manufacturing a permanent-magnet type synchronous motor by fixing a stator core in a frame, the method comprising positioning the frame and the stator core in an arrangement, in which stress applied on the stator core from the frame assumes an extreme point in a predetermined region of the stator core every type of the motor, to fix the stator core to the frame.

12. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 11, wherein a frame having a substantially circular shape including an elliptical shape is adopted for the frame, and the stator core is positioned so that a teeth center line or a slot center line of the stator core is made consistent with a minor axis or a major axis of the frame, and fixed to the frame.

13. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 11, wherein positioning between the frame and the stator core is made so that an arrangement, in which stress applied on the stator core from the frame becomes maximum, becomes consistent with a teeth center line or a slot center line of the stator core, and the stator core is fixed to the frame.

14. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 11, wherein a square

frame is used for the frame, positioning is made so that a teeth center line or a slot center line of the stator core is made consistent with a diagonal line of the frame, and the stator core is fixed to the frame.

15. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 11, wherein positioning between the frame and the stator core is made every type of the motor so that an arrangement, in which stress applied on the stator core from the frame becomes minimum or maximum in a thickness distribution in a normal direction of the frame, and becomes minimum in rate of change of the thickness, becomes consistent with a teeth center line or a slot center line of the stator core, and the stator core is fixed to the frame.

16. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 11, wherein when positioning is made every type of the motor so that an arrangement, in which stress applied on the stator core from the frame becomes minimum or maximum, becomes consistent with a teeth center line or a slot center line of the stator core, positioning between the frame and the stator core is made in an angular region in a range of positioning accuracy in view of manufacture, and the stator core is fixed to the frame.

17. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 11, wherein an articulation type stator core, which needs butt portions or

welds, or a thin-wall connection type stator core is adopted, positioning between the frame and the stator core is made so that an arrangement, in which a thickness distribution in a normal direction of the frame becomes minimum and the thickness becomes minimum in rate of change, becomes consistent with the butt portions or welds, and the stator core is fixed to the frame.

18. The method of manufacturing a permanent-magnet type synchronous motor, according to claim 16 or 17, wherein a range of accuracy at the time of positioning is in an angular region of  $\pm 10$  degrees.